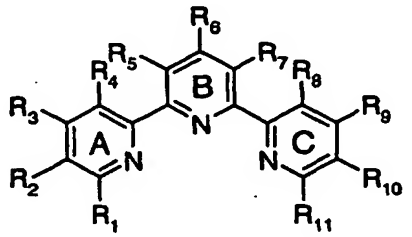
What is claimed is:

1. Use, as a catalyst for oxidation reactions using molecular oxygen and/or air, of at least one metal complex compound of formula (1)

$[L_nMe_mX_p]^zY_q$ (1),

wherein
Me is manganese, titanium, iron, cobalt, nickel or copper,
X is a coordinating or bridging radical,
n and m are each independently of the other an integer having a value of from 1 to 8,
p is an integer having a value of from 0 to 32,
z is the charge of the metal complex,
Y is a counter-ion,
q = z/(charge of Y), and
L is a ligand of formula (2)



(2),

wherein
R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11} are each independently of the others hydrogen; unsubstituted or substituted C_1-C_{18}alkyl or aryl; cyano; halogen; nitro; -$COOR_{12}$ or -SO_3R_{12} wherein R_{12} is in each case hydrogen, a cation or unsubstituted or substituted C_1-C_{18}alkyl or aryl; -SR_{13}, -SO_2R_{13} or -OR_{13} wherein R_{13} is in each case hydrogen or unsubstituted or substituted C_1-C_{18}alkyl or aryl; -$NR_{14}R_{15}$; -(C_1-C_6alkylene)-$NR_{14}R_{15}$; -$N^{\oplus}R_{14}R_{15}R_{16}$; -($C_1$-$C_6$alkylene)-$N^{\oplus}R_{14}R_{15}R_{16}$; –N($R_{13}$)-($C_1$-$C_6$alkylene)-$NR_{14}R_{15}$; –N[($C_1$-$C_6$alkylene)-$NR_{14}R_{15}$]$_2$; –N($R_{13}$)-($C_1$-$C_6$alkylene)-$N^{\oplus}R_{14}R_{15}R_{16}$; –N[($C_1$-$C_6$alkylene)-$N^{\oplus}R_{14}R_{15}R_{16}$]$_2$; -N($R_{13}$)-N-$R_{14}R_{15}$ or –N(R_{13})-$N^{\oplus}R_{14}R_{15}R_{16}$ wherein R_{13} is as defined above and R_{14}, R_{15} and R_{16} are each independently of the other(s) hydrogen or

unsubstituted or substituted C_1-C_{18}alkyl or aryl, or R_{14} and R_{15}, together with the nitrogen atom linking them, form an unsubstituted or substituted 5-, 6- or 7-membered ring which may contain further hetero atoms.

2. Use according to claim 1, wherein Me is manganese, which is in oxidation state II, III, IV or V.

3. Use according to either claim 1 or claim 2, wherein
X is CH_3CN, H_2O, F^-, Cl^-, Br^-, HOO^-, O_2^{2-}, O^{2-}, $R_{17}COO^-$, $R_{17}O^-$, $LMeO^-$ or $LMeOO^-$, wherein
R_{17} is hydrogen or unsubstituted or substituted C_1-C_{18}alkyl or aryl, and
L and Me are as defined in claim 1.

4. Use according to any one of claims 1 to 3, wherein
Y is $R_{17}COO^-$, ClO_4^-, BF_4^-, PF_6^-, $R_{17}SO_3^-$, $R_{17}SO_4^-$, SO_4^{2-}, NO_3^-, F^-, Cl^-, Br^- or I^-, wherein
R_{17} is hydrogen or unsubstituted or substituted C_1-C_{18}alkyl or aryl.

5. Use according to any one of claims 1 to 4, wherein
n is an integer having a value of from 1 to 4, especially 1 or 2.

6. Use according to any one of claims 1 to 5, wherein
m is an integer having a value of 1 or 2, especially 1.

7. Use according to any one of claims 1 to 6, wherein
p is an integer having a value of from 0 to 4, especially 2.

8. Use according to any one of claims 1 to 7, wherein
z is an integer having a value of from 8- to 8+.

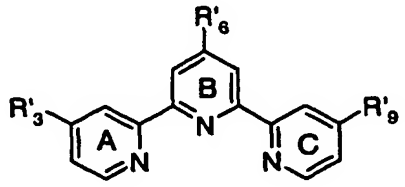
9. Use according to any one of claims 1 to 8, wherein aryl is phenyl or naphthyl each unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, halogen, cyano, nitro, carboxy, sulfo, hydroxy, amino, N-mono- or N,N-di-C_1-C_4alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or by naphthyloxy.

10. Use according to any one of claims 1 to 9, wherein

the 5-, 6- or 7- membered ring formed by R_{14} and R_{15} together with the nitrogen atom linking them is an unsubstituted or C_1-C_4alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring.

11. Use according to any one of claims 1 to 10, wherein
R_6 is preferably C_1-C_{12}alkyl; phenyl unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, halogen, cyano, nitro, carboxy, sulfo, hydroxy, amino, N-mono- or N,N-di-C_1-C_4alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthyl-amino, phenyl, phenoxy or by naphthyloxy; cyano; halogen; nitro; $-COOR_{12}$ or $-SO_3R_{12}$ wherein R_{12} is in each case hydrogen, a cation, C_1-C_{12}alkyl, unsubstituted phenyl or phenyl substituted as indicated above; $-SR_{13}$, $-SO_2R_{13}$ or $-OR_{13}$ wherein R_{13} is in each case hydrogen, C_1-C_{12}alkyl, unsubstituted phenyl or phenyl substituted as indicated above; $-N(R_{13})-NR_{14}R_{15}$ wherein R_{13} is as defined above and R_{14} and R_{15} are each independently of the other hydrogen, unsubstituted or hydroxy-substituted C_1-C_{12}alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R_{14} and R_{15}, together with the nitrogen atom linking them, form an unsubstituted or C_1-C_4alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring; $-NR_{14}R_{15}$ or $-N^{\oplus}R_{14}R_{15}R_{16}$ wherein R_{14}, R_{15} and R_{16} are each independently of the other(s) hydrogen, unsubstituted or hydroxy-substituted C_1-C_{12}alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R_{14} and R_{15}, together with the nitrogen atom linking them, form an unsubstituted or C_1-C_4alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring; and
R_1, R_2, R_3, R_4, R_5, R_7, R_8, R_9, R_{10} and R_{11} are as defined above or are hydrogen.

12. Use according to claim 11, wherein the ligand L is a compound of formula (3)



(3)

wherein
R'_3, R'_6 and R'_9 have the meanings given for R_6 in claim 11.

13. Use according to claim 12, wherein
R'_3, R'_6 and R'_9 are each independently of the others C_1-C_4alkoxy; hydroxy; phenyl unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, phenyl or by hydroxy; hydrazine;

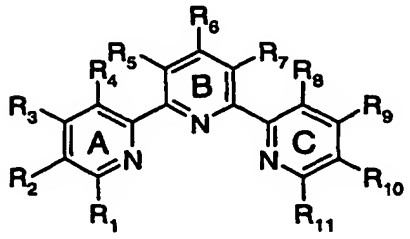
amino; N-mono- or N,N-di-C_1-C_4alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety; or an unsubstitituted or C_1-C_4alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring.

14. Use according to claim 13, wherein
R_6 is hydroxy.

15. Use according to any one of claims 1 to 10, wherein there is used at least one metal complex compound of formula (1')

$$[L'_nMe_mX_p]^zY_q \qquad (1'),$$

wherein
Me is manganese, titanium, iron, cobalt, nickel or copper,
X is a coordinating or bridging radical,
n and m are each independently of the other an integer having a value of from 1 to 8,
p is an integer having a value of from 0 to 32,
z is the charge of the metal complex,
Y is a counter-ion,
q = z/(charge of Y), and
L' is a ligand of formula (2')



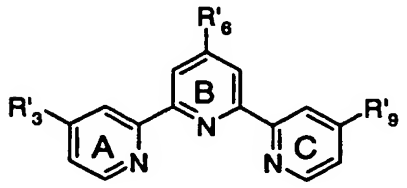
(2')

wherein
R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11} are each independently of the others hydrogen; unsubstituted or substituted C_1-C_{18}alkyl or aryl; cyano; halogen; nitro; -$COOR_{12}$ or -SO_3R_{12} wherein R_{12} is in each case hydrogen, a cation or unsubstituted or substituted C_1-C_{18}alkyl or aryl; -SR_{13}, -SO_2R_{13} or -OR_{13} wherein R_{13} is in each case hydrogen or unsubstituted or substituted C_1-C_{18}alkyl or aryl; -$NR_{14}R_{15}$; -(C_1-C_6alkylene)-$NR_{14}R_{15}$; -$N^{\oplus}R_{14}R_{15}R_{16}$; -($C_1$-$C_6$alkylene)-$N^{\oplus}R_{14}R_{15}R_{16}$; –$N(R_{13})$-($C_1$-$C_6$alkylene)-$NR_{14}R_{15}$; –$N[(C_1$-$C_6$alkylene)-$NR_{14}R_{15}]_2$; –$N(R_{13})$-($C_1$-$C_6$alkylene)-$N^{\oplus}R_{14}R_{15}R_{16}$;

$-N[(C_1\text{-}C_6alkylene)\text{-}N^{\oplus}R_{14}R_{15}R_{16}]_2$; $\text{-}N(R_{13})\text{-}N\text{-}R_{14}R_{15}$ or $-N(R_{13})\text{-}N^{\oplus}R_{14}R_{15}R_{16}$, wherein R_{13} is as defined above and R_{14}, R_{15} and R_{16} are each independently of the other(s) hydrogen or unsubstituted or substituted $C_1\text{-}C_{18}$alkyl or aryl, or R_{14} and R_{15}, together with the nitrogen atom linking them, form an unsubstituted or substituted 5-, 6- or 7-membered ring which may contain further hetero atoms, with the proviso that
at least one of the substituents R_1 to R_{11} is a quaternised nitrogen atom that is not bonded directly to one of the three pyridine rings A, B or C.

16. Use according to claim 15, wherein
R_6 is C_{12}alkyl; phenyl unsubstituted or substituted by $C_1\text{-}C_4$alkyl, $C_1\text{-}C_4$alkoxy, halogen, cyano, nitro, carboxy, sulfo, hydroxy, amino, N-mono- or N,N-di-$C_1\text{-}C_4$alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or by naphthyloxy; cyano; halogen; nitro; $\text{-}COOR_{12}$ or $\text{-}SO_3R_{12}$ wherein R_{12} is in each case hydrogen, a cation, $C_1\text{-}C_{12}$alkyl, unsubstituted phenyl or phenyl substituted as indicated above; $\text{-}SR_{13}$, $\text{-}SO_2R_{13}$ or $\text{-}OR_{13}$ wherein R_{13} is in each case hydrogen, $C_1\text{-}C_{12}$alkyl, unsubstituted phenyl or phenyl substituted as indicated above; $\text{-}NR_{14}R_{15}$; $\text{-}(C_1\text{-}C_6alkylene)\text{-}NR_{14}R_{15}$; $\text{-}N^{\oplus}R_{14}R_{15}R_{16}$; $\text{-}(C_1\text{-}C_6alkylene)\text{-}N^{\oplus}R_{14}R_{15}R_{16}$; $\text{-}N(R_{13})\text{-}(C_1\text{-}C_6alkylene)\text{-}NR_{14}R_{15}$; $-N(R_{13})\text{-}(C_1\text{-}C_6alkylene)\text{-}N^{\oplus}R_{14}R_{15}R_{16}$; $\text{-}N(R_{13})\text{-}N\text{-}R_{14}R_{15}$ or $\text{-}N(R_{13})\text{-}N^{\oplus}R_{14}R_{15}R_{16}$, wherein R_{13} may have any one of the above meanings and R_{14}, R_{15} and R_{16} are each independently of the other(s) hydrogen, unsubstituted or hydroxy-substituted $C_1\text{-}C_{12}$alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R_{14} and R_{15}, together with the nitrogen atom linking them, form a pyrrolidine, piperidine, piperazine, morpholine or azepane ring which is unsubstituted or substituted by at least one unsubstituted $C_1\text{-}C_4$alkyl and/or substituted $C_1\text{-}C_4$alkyl, wherein the nitrogen atom may be quaternised, and R_1, R_2, R_3, R_4, R_5, R_7, R_8, R_9, R_{10} and R_{11} may be as defined in claim 1 or are hydrogen.

17. Use according to either claim 15 or claim 16, wherein the ligand L' is a compound of formula (3')



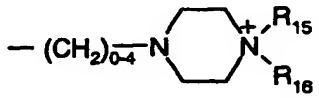
(3')

wherein

R'_3, R'_6 and R'_9 have the meanings given for R_6 in claim 15 or claim 16, but R'_3 and R'_9 may additionally be hydrogen.

18. Use according to claim 17, wherein

R'_3, R'_6 and R'_9 are each independently of the others phenyl unsubstituted or substituted by C_1-C_4alkyl, C_1-C_4alkoxy, halogen, phenyl or by hydroxy; cyano; nitro; -$COOR_{12}$ or -SO_3R_{12} wherein R_{12} is in each case hydrogen, a cation, C_1-C_4alkyl or phenyl; -SR_{13}, -SO_2R_{13} or -OR_{13} wherein R_{13} is in each case hydrogen, C_1-C_4alkyl or phenyl; -$N(CH_3)$-NH_2 or -NH-NH_2; amino; N-mono- or N,N-di-C_1-C_4alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, wherein the nitrogen atoms, especially the nitrogen atoms not bonded to one of the three pyridine rings A, B or C, may be quaternised; N-mono- or N,N-di-C_1-C_4alkyl-$N^{\oplus}R_{14}R_{15}R_{16}$ unsubstituted or substituted by hydroxy in the alkyl moiety, wherein R_{14}, R_{15} and R_{16} are each independently of the others hydrogen, unsubstituted or hydroxy-substituted C_1-C_{12}alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R_{14} and R_{15}, together with the nitrogen atom linking them, form a pyrrolidine, piperidine, piperazine, morpholine or azepane ring which is unsubstituted or substituted by at least one C_1-C_4alkyl or by at least one unsubstituted C_1-C_4alkyl and/or substituted C_1-C_4alkyl, wherein the nitrogen atom may be quaternised; N-mono- or N,N-di-C_1-C_4alkyl-$NR_{14}R_{15}$ unsubstituted or substituted by hydroxy in the alkyl moiety, wherein R_{14} and R_{15} may be as defined above; or a radical

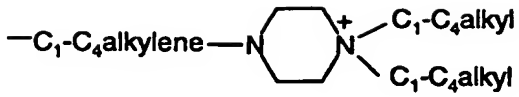


wherein R_{15} and R_{16} have the meanings given above, preferably C_1-C_4alkyl, and the ring is unsubstituted or substituted, wherein R'_3 and R'_9 likewise may additionally be hydrogen.

19. Use according to either claim 17 or claim 18, wherein

R_6 is hydroxy.

20. Use according to any one of claims 15 to 19, wherein at least one of the substitutents R_1 to R_{11}, preferably one of the substituents R_3, R'_3, R_6, R'_6, R_9 and/or R'_9, is one of the radicals



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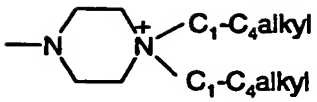

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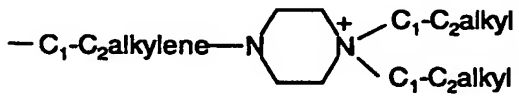
wherein the unbranched or branched alkylene group may be unsubstituted or substituted and wherein the alkyl groups, which are unbranched or branched independently of one another, may be unsubstituted or each independently of the others substituted and wherein the piperazine ring may be unsubstituted or substituted.

21. Use according to any one of claims 15 to 20 wherein at least one of the substituents R_1 to R_{11}, preferably one of the substituents R_3, R'_3, R_6, R'_6, R_9 and/or R'_9, is one of the radicals



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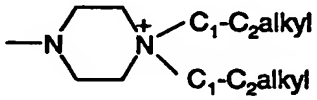

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wherein the unbranched or branched alkylene group may be unsubstituted or substituted and wherein the alkyl groups, each independently of the others, may be unsubstituted or substituted and wherein the piperazine ring may be unsubstituted or substituted.

22. Use according to any one of claims 1 to 21 for the bleaching of stains or of soiling on textile material, or for the prevention of redeposition of migrating dyes in the context of a hydrogen peroxide-free washing process, or for the cleaning of hard surfaces.

23. Use according to any one of claims 1 to 21, wherein the metal complex compounds of formula (1) and/or (1') are used as catalysts for reactions using molecular oxygen and/or air for bleaching in the context of paper making.

24. Use according to any one of claims 1 to 21, wherein the metal complex compounds of formula (1) and/or (1') are used in selective oxidation reactions in the context of organic synthesis.

25. Use according to any one of claims 1 to 21, wherein the metal complex compounds of formula (1) and/or (1') are used in detergent, cleaning, disinfecting or bleaching compositions.

26. Use according to claim 25, wherein the metal complex compounds of formula (1) and/or (1') are formed *in situ* in the detergent, cleaning, disinfecting or bleaching composition.

27. A detergent, cleaning, disinfecting or bleaching composition containing

I) from 0 to 50% by weight A) of at least one anionic surfactant and/or B) one non-ionic surfactant,

II) from 0 to 70% by weight C) of at least one builder substance,

III) D) at least one metal complex compound of formula (1) and/or (1') as defined in any one of claims 1 to 26 in an amount that, in the liquor, gives a concentration of from 0.5 to 100 mg/litre of liquor, preferably from 1 to 50 mg/litre of liquor, when from 0.5 to 20 g/litre of the detergent, cleaning, disinfecting or bleaching composition are added to the liquor, and

IV) water ad 100% by weight,

wherein the percentages are in each case percentages by weight, based on the total weight of the composition.

28. A solid formulation containing

a) from 1 to 99% by weight of at least one metal complex compound as defined in any one of claims 1 to 21,

b) from 1 to 99% by weight of at least one binder,

c) from 0 to 20% by weight of at least one encapsulating material,

d) from 0 to 20% by weight of at least one further additive and also

e) from 0 to 20% by weight water.

29. A solid formulation according to claim 28, which is in the form of granules.